

amateur builder is usually interested, wood still offers many advantages. Relatively low cost, availability, and not the least of its wonders, tremendous ease in working, are some of the facts that make wooden construction attractive. Wood, when properly treated and used, is more rugged pound for pound than metal. No special skills are ordinarily needed as is true of metal or tubing construction.

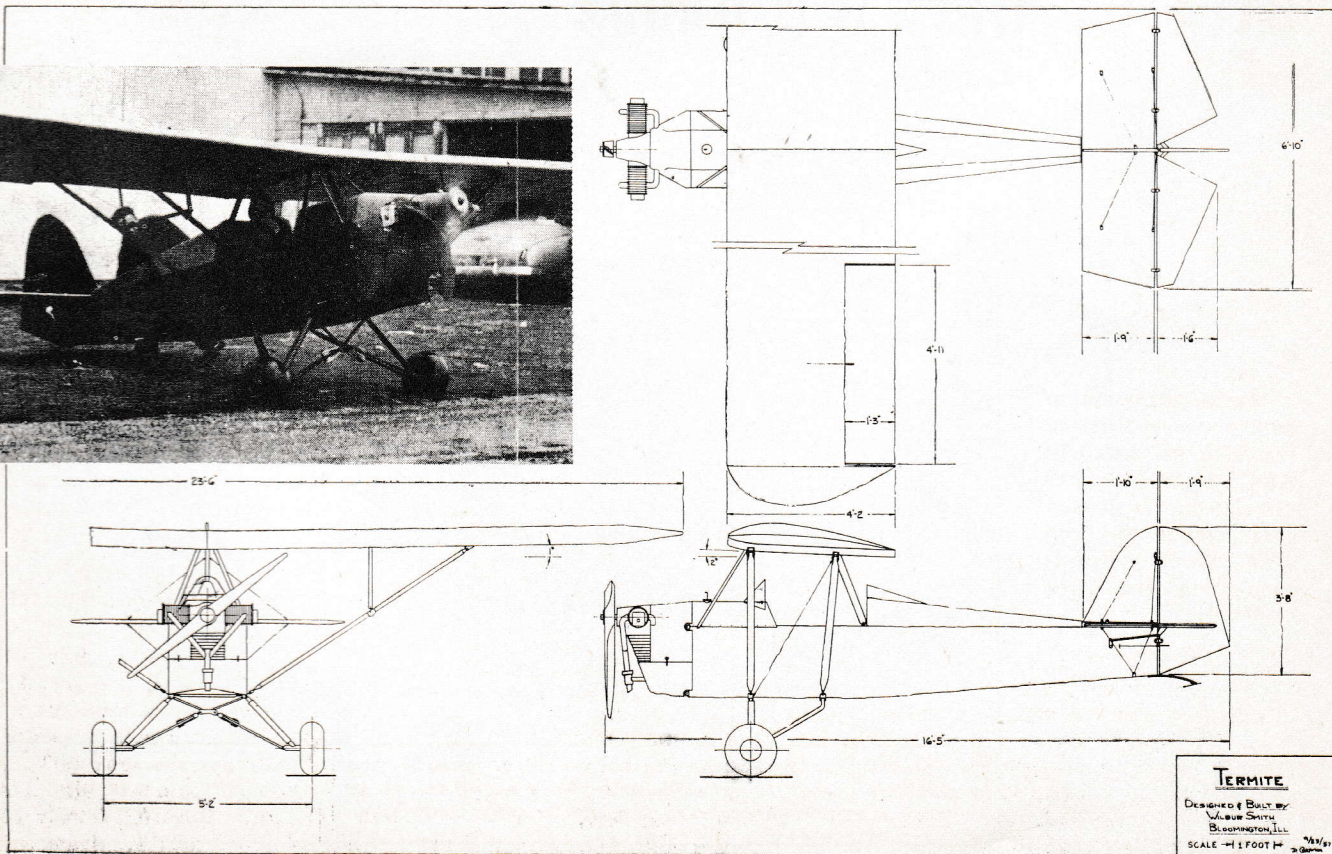
Wilbur L. Smith of Bloomington, Ill., believes in the homebuilt wooden airplane. He has gone several steps further than merely having the belief and has designed and built the Smith Special, an 80 mph., parasol, strut-braced monoplane powered with an Aeronca engine. The 23 ft. span plane is built entirely of wood with the exception of the landing gear, motor mount, wing struts and fittings. Smitty, as he is known to his fellow members in Chapter 29 (of which he is vice-president), says "My aim was to build a small, ultra-light plane of simple construction at the least possible cost".

## Smitty's "Termite"

By Dick Forrest

Wood, one of the oldest materials worked by man, was used successfully in airplanes for many years. When weights and speeds began to rise and quantity production became prevalent in the aircraft industry, wood was eclipsed by metal. For planes in which the

Smitty's background in aviation began in 1928 when he earned flying time by selling tickets and helping to maintain an OX-5 Canuck owned and operated by a friend. Interest in experimental aircraft led him to rebuild a homebuilt monoplane of that period powered with a converted aircooled Ford Model T engine. Time built up in Aeronca C-3's, Buhl "Bullpups" and Curtiss Juniors gave Smitty a taste for the light planes that has stayed with him through the years and finally culminated with the idea of building the Special. Because of building a home and the plane simultaneously, four years passed before the finished ship took to the air. Six to eight months



of spare time work should be sufficient to build the entire plane if there are no other projects on hand.

The Smith Special or "Termite" is of very simple construction, as can be seen from the excellent drawings as prepared by member Don Cookman of Petersham, Mass. Smitty made the original plans for the ship by laying out the outline with chalk on his basement floor and proceeding from there. The construction of the fuselage and tail unit follows very closely that of the Pietenpol Air Camper of 1930 vintage. For information concerning the Pietenpol see the 1932 edition of the Flying and Glider Manual and the May, 1956 EXPERIMENTER.

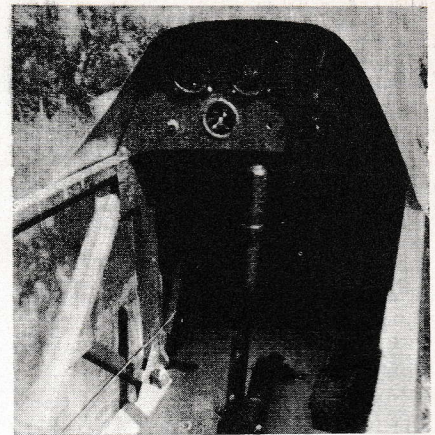
All longerons and cross braces are  $\frac{7}{8}$  in. x  $\frac{7}{8}$  in. aircraft quality spruce and gussets are made from  $\frac{1}{8}$  in. birch plywood. The fuselage sides and bottom back to Station 3 and the top back to Station 2 are covered with  $\frac{1}{8}$  in. plywood. At Station 2, a  $\frac{1}{2}$  in. plywood web is built between the  $\frac{7}{8}$  in. fuselage members and with the firewall and a  $\frac{1}{8}$  in. plywood back on Station 3, this entire section of the fuselage makes a strong, tight box.

The rear section of a Cub J-3 torque tube supplies the stick control with the elevators operated by a torque tube and the ailerons operated in the same manner as the Baby Ace. The rudder pedals are also from the J-3. The landing gear, another part from the Cub, is cut down to fit the "Termite", with Cub front wing struts welded over the front gear struts. Although the original "Termite" was not equipped with bakes or a tail wheel, Smitty feels that these would be no problem to add. At the present time he has a small,  $2\frac{1}{2}$  in. by 1 in. caster for a tail wheel and finds no difficulty in taxiing or ground control without brakes.

The wing uses the spars, drag bracing and fittings from the Aeronca K. Ailerons and wings are shortened in the same manner as Owen Billman's Little Pink Cloud, as described in the June 1956 EXPERIMENTER. Smitty made all new ribs although the Aeronca K ribs with the well-known Clark Y section could have been used. Each wing panel is 11 ft. 3 in. long with the 6 in. between at the center covered with a metal fairing running from the front of the front center strut over the wing to the rear of the rear center strut.

The wing struts used on the original "Termite" were taken from two different planes. The rear struts were made from Taylorcraft struts with the adjustment at the inner end. The front struts were made from Welch O-2 front struts with Cub J-3 adjustable ends welded on the inner end. The Welch, a rarity in its prime around 1940 and even scarcer today, was a small two-place ship somewhat similar to the early Aeroncas. A  $\frac{1}{8}$  in. cable is used for drag bracing between the top outer rear strut and the front bottom strut fitting like the Baby Ace.

On February 10, 1957 the Smith Special made its first flight and happily exceeded all Smitty's expectations. The plane trimmed out with only minor adjustments, and cruised at 79 mph at 2250 rpm with the Aeronca E-113C 36 hp engine. Top speed at 2400 rpm has been clocked at 93 mph. After a short takeoff run, the "Termite" climbed out at 450 ft/min. with the 155 lb. designer and builder aboard. A 220



#### "Termite" Specifications

Power plant	Aeronca E113-C 36 hp.
Empty weight	394 lbs.
Loaded weight	628 lbs.
Cruising speed @ 2250 rpm	80 mph
Stalling speed @ 814 ft. above sea level	32 mph
Top speed @ 2400 rpm	93 mph
Airfoil section	Clark Y

lb. friend has flown the "Termite" without causing the little ship to falter. The controls are light and positive with stalls clean, having no tendency to fall off on either wing. Due to the short length of the "Termite", the nose appears high at first on takeoffs and landings but the pilot becomes accustomed to this rapidly. For fuselage strength, no door was designed for the cockpit, but Smitty says that after getting in and out a few times, this presents no problem.

The Special became known fondly as the "Termite" locally after a number of people had flown it and thought highly of its good flight characteristics. With a landing speed of 32 mph few spots are too small for the "Termite". This slow landing speed aided Smitty in the one mishap that he has had with the plane. In his 50th hour of testing, the crankshaft of the Aeronca engine broke and Smitty was forced to land in a field of alfalfa. The "Termite" flipped over on its back and Smitty crawled out, unhurt, to inspect the results. Other than one broken wing rib and minor damage to the top of the rudder, the ship was OK. The "Termite" has since been repaired and a Continental A-40 installed in place of the Aeronca engine.

The Smith Special was originally designed for the 36 hp Aeronca engine because designer-builder Smith had two of them and was interested in a plane of truly low power. Smitty feels that with a little beefing up of the forward section of the fuselage the plane could be powered with a 65 hp engine as the structure is rugged. He is of the opinion that the 55 Lycoming would be a perfect engine for this plane. If a second model were to be built, only a few minor changes would be made, in general lightening the structure. More detailed plans will be available soon from Wilbur L. Smith, 1209 North Rosney, Bloomington, Ill.